

No. 12. — *Vertebrata from the Savanna of Panama*.¹

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I. INTRODUCTION. BY OUTRAM BANGS.

IN the process of the John E. Thayer Expedition of 1904, Mr. W. W. Brown, Jr., spent nearly a month — the greater part of May, 1904 — near the city of Panama, making general collections of vertebrates.

The region is quite different in character from the hilly, heavily forested interior of the Isthmus, and is described in a letter by Mr. Brown as follows: "My headquarters are at Calidonia at the edge of the swamp of Panama, about a mile from the seashore and about seventy-five yards from the beginning of the mangroves. Toward the north and northeast, the low flat country or Savanna of Panama extends for some four or five miles, gradually rising, to the hills. This is a grassy plain, very dry and burnt in appearance, especially in the dry season, with little patches of wood — island like — scattered about here and there. Near the city of Panama there are several orange groves, where I collected Blue-creepers and some Tanagers that I did not see elsewhere."

We did not expect any novel results in the way of species from this collection, but the region is so different — dry and barren — from the country farther inland, at Loma del Leon, etc., where most of the bird collecting on the Isthmus has been done, that we felt it quite worth while to have a representative series from the Savanna of Panama.

Mr. Garman in his list includes the fishes from Gorgona Island and the Pearl Islands, as well as those from the vicinity of Panama, while Mr. Barbour notices the reptiles and amphibians from the vicinity of Panama and from the Pearl Islands.

¹ Papers from the John E. Thayer Expedition of 1904, No. 3.

II. MAMMALIA. BY OUTRAM BANGS.

During his stay of nearly a month, Mr. Brown set traps for the smaller mammals, at every sort of place on the Savanna of Panama and the edge of the mangrove swamps, but caught nothing, and he saw no signs of small mammals. When I stated this fact to Mr. E. W. Nelson, he said that his experience in Mexico had been much the same, and that such regions in middle America — low, hot, arid plains — are almost without mammalian life.

One vesper rat (*Oryzomys panamensis* Thomas; type locality, near city of Panama), however, has been described from this region.

Mr. Brown secured specimens of four species of mammals, — one squirrel and three bats.

SCIURIDAE.

1. *Sciurus adolphei dorsalis* (GRAY).

Five adult specimens, both sexes, May 20 to 25.

These are all practically alike in color, except that in some the black is faded, usually in patches, by long wear, to a rusty brown. They are in the "Grizzled-backed phase" of Nelson, with head and back mixed black and yellowish; under parts pale buff; tail buff, below along middle, black above and on sides, each hair tipped with white. I cannot see that they differ from Costa Rican examples in the same phase of coloring. It is rather interesting that they do not, as north of Panama in Chiriqui and at Punta Burica, Costa Rica, the permanently black form — *Sciurus melania* (Gray) — occurs, which would thus appear to be merely a colony of melanistic individuals, and hardly a species (or subspecies) in the true sense of the term.

The flesh measurements are :

| No. | Sex. | Total length. | Tail vertebrae | Hind foot. | Ear |
|--------|-------|---------------|----------------|------------|-----|
| 10,810 | ♂ ad. | 528 | 270 | 60 | 32 |
| 10,811 | ♂ ad. | 522 | 280 | 60 | 31 |
| 10,812 | ♀ ad. | 528 | 270 | 60 | 32 |
| 10,813 | ♀ ad. | 523 | 270 | 60 | 30 |
| 10,814 | ♀ ad. | 522 | 260 | 60 | 31 |

MOLOSSIDAE.

2. *Promops nanus* MILLER.

One adult ♂, May 20.

PHYLLOSTOMATIDAE.

3. *Hemiderma castaneum* (H. ALLEN).

Seven specimens, young and adult, May 22 to 25.

4. *Artibeus intermedius* J. A. ALLEN.

One adult ♂, May 20.

III. AVES. BY JOHN E. THAYER AND OUTRAM BANGS.

The ornithology of the Savanna of Panama and the mangrove swamps of the coasts of the bay, though interesting as compared with that of the interior of the Isthmus, is not rich in number of species. Mr. Brown's collection includes but eighty-six species, of which one only, the alder flycatcher, is a North American migrant. The country is little diversified, and so sparsely wooded that one would not look for a rich bird fauna.

The characteristic birds of the Savanna are the pigmy titlark, *Anthus parvus*; the red-breasted blackbird, *Leistes militaris*; the Lawrence's cacique, *Cacicus vitellinus*; the grassquit, *Tiaris olivacea dissita*, and the fork-tailed tyrant, *Muscivora tyrannus*. In the little islands of woodland scattered over the Savanna the smaller tyrants, ant thrushes, wrens, and other brush and forest-loving species were found in small numbers, while in the mangrove swamps Mr. Brown secured a few specimens of the rare mangrove warbler, *Chrysocantor erithachorides*, which, though very common in the mangroves of the Pearl Islands, was exceedingly rare in the swamps near the city of Panama.

The natives shoot large numbers of birds for food, and the species most persecuted are very shy and are decreasing in numbers; the grackle, *Megascopus major macrourus*, the wood grouse, *Odontophorus marmoratus*, the ortalis, *Ortalis cinereiceps*, and the doves are the species most sought for.

In this paper we describe three new forms, — the momot, usually previously referred to the Colombian *Momotus subrufescens*; the Panama golden-crowned tyrant, which proves separable from *Tyrannulus reguroides*; and the grassquit, — a well-marked southern continental form of *Tiaris olivacea*.

During the month that Mr. Brown spent on the Savanna of Panama, he secured specimens of all the species observed.

ARDEIDAE.

1. *Butorides striata* (LINNÉ).

One adult ♀, May 26, 1904. This skin, No. 14030, affords the following measurements: wing, 168.5; tail, 61; tarsus, 51; exposed culmen, 63. It does not appear to differ in any way from birds from Brazil and Guiana.

FALCONIDAE.

2. *Buteo brachyurus* VIEILL.

One adult ♂ in the dusky phase of plumage, May 4.

3. *Rupornis ruficauda* (SCL. & SALV.)

One ♀, May 25.

CRACIDAE.

4. *Ortalis cinereiceps* (GRAY).

One ♀, May 21.

ODONTOPHORIDAE.

5. *Odontophorus marmoratus* GOULD.

Two males, one adult, May 23, one young, May 17. These are perfectly typical examples of *O. marmoratus*, and show no approach to *O. castigatus* of Chiriqui, which, notwithstanding Ogilvie-Grant's statement, is a very different well-marked form.

COLUMBIDAE.

6. *Columbigallina minuta* (LINNÉ).

Seven adults of both sexes, May 10 to 26.

7. *Claravis pretiosa* (FERRARI-PEREZ).

Two adult males, May 14 and 21.

8. *Leptotila verreauxi* Bp.

Two males, one adult, May 18, one young, May 20.

CUCULIDAE.

9. *Piaya cayana thermophila* (SCL.).

Five adults, both sexes, May 4 to 21.

10. *Diplopterus naevius* (LINNÉ).

Five adults, both sexes, May 19 to 25.

11. *Crotophaga ani* LINNÉ.

One ♀, May 2.

PSITTACIDAE.

12. *Brotogerys jugularis* MÜLLER.

Twenty-three, adults of both sexes, May 12 to 26.

MOMOTIDAE.

13. *Momotus conexus*, sp. nov.

Six adults, both sexes, May 6 to 26.

Type. — Coll. E. A. and O. Bangs, No. 14,054, adult ♀, Savanna of Panama, Panama, May 6, 1904.

Characters. — A very distinct form at once distinguished from *M. lessoni* Less. of Central America by its much smaller size and smaller bill, as well as different coloration, — the throat in *M. lessoni* being always green to base of bill, without a hazel chin-spot. From *M. subrufescens* Sel. of northern South America, the Panama bird differs in darker general coloration; the back is uniform dark green, becoming chestnut only on nape just below the blue of back of crown (in *M. subrufescens* the neck and mantle are pale tawny more or less suffused with light green); under parts much darker, — hazel or chestnut (tawny ochraceous-rufous in *M. subrufescens*), the throat and upper breast strongly suffused with dark green; a conspicuous hazel chin-spot.

Measurements. —

| No. | Sex. | Wing. | Tail. | Tarsus. | Culmen. |
|-----------------|-------|-------|--------------------------------------|---------|---------|
| 14,054 type | ♀ ad. | 125. | 228. | 27.5 | 38. |
| 14,055 topotype | ♀ ad. | 121. | 217. | 26. | 40. |
| 14,056 | ♂ ad. | 126. | 231.5 | 26.5 | 37.5 |
| 14,057 | ♂ ad. | 121. | 227. | 27.5 | 38. |
| 40,672 M.C.Z. | ♀ ad. | 118. | 205. ^{much} _{worn} | 26. | 37. |
| B. | ♀ ad. | 126. | 219. | 26.5 | 39. |

Remarks. — The Panama bird has always been referred to *M. subrufescens* Sel. Type locality Santa Marta, Colombia, but is so different from that form in color that it must certainly be regarded as at least a subspecies, — but if a subspecies, then of what? All of the many recognized forms of blue-headed motmots, from eastern Mexico south to Amazonia and Bolivia, are so much alike, it would not be at all surprising to find that in reality they are all but representative geographical races — subspecies — of one wide-ranging variable species.

ALCEDINIDAE.

14. *Ceryle americana septentrionalis* SHARPE.

Three, both sexes, May 4 to 26.

CAPRIMULGIDAE.

15. *Nyctidromus albicollis* (GMEL.).

One male, May 26.

16. *Stenopsis cayennensis* (GMEL.).

One adult ♂, May 4.

17. *Anthrostomus rufus* (BODD.).

One adult ♀, May 6.

TROCHILIDAE.

18. *Amizilis tzalatl* (L. LAVE).

Two males, May 4 and 9.

TROGONIDAE.

19. *Trogon caligatus concinnus* (LAWR.).

One adult ♂, May 15.

PICIDAE.

20. *Melanerpes wagleri wagleri* SALV. & GODM.

Two males, May 11 and 20.

FORMICARIIDAE.

21. *Thamnophilus transandeanus* SCL.¹

Four adults, both sexes, May 4 to 22.

22. *Thamnophilus atrinucha* SALV. & GODM.

One adult ♀, May 13.

23. *Thamnophilus nigricristatus* LAWR.

Six adults, both sexes, May 7 to 10.

¹ The nomenclature of the ant thrushes here followed is that of Sharpe's Hand List, Vol. 3, 1901.

24. *Rhamphocaenus rufiventris* (BP.).

Three adult males, May 8 and 9.

25. *Cercomacra tyrannina* (SCL.).

One ♂, May 21.

26. *Cercomacra nigricans* SCL.

Seven adults, both sexes, May 6 to 21.

27. *Drymophila swainsoni* BERLEPSCH.

Six adults, both sexes, May 9 to 11.

28. *Hypocnemis naevioides* (LAFR.).

Three adults, both sexes, May 14 to 26.

DENDROCOLAPTIDAE.

29. *Xiphorhynchus*¹ *nanus nanus* (LAWR.).

Three specimens, both sexes, May 11 to 25.

PIPRIDAE.

30. *Chiroxiphia lanceolata* (WAGL.).

Ten adults, both sexes, May 3 to 26.

31. *Manacus vitellinus* (GOULD).

Fifteen specimens, both sexes, May 3 to 21.

TYRANNIDAE.

32. *Todirostrum cinereum finitimum* BANGS.

Two adult males, May 2 and 17.

33. *Todirostrum schistaceiceps* SCL.

One adult ♀, May 8.

34. *Colopteryx pilaris* (CAB.).

Two adults, ♂ and ♀, May 8.

35. *Myiopagis placens accola* BANGS.

One adult ♀, May 13.

¹ For change from *Dendrornis* to *Xiphorhynchus*, cf. Oberholser, Smith. Misc. Coll., Vol. 48, pt. 1, No. 1579, pp. 62-63, May 13, 1905.

36. *Capsiempis flaveola* (LIGHT.).

Five adults, both sexes, May 7 to 18.

37. *Ornithion pusillum* (CAB. & HEINE).

Two adults, ♂ and ♀, May 5 and 13.

38. *Tyrannulus reguloides panamensis*, subsp. nov.

Three adults, ♂ ♂, ♀, May 6 to 22.

Type. — Coll. E. A. and O. Bangs, No. 14,092, adult ♂, Savanna of Panama, May 6, 1904.

Characters. — Similar to true *T. reguloides* Ridg. of the Lower Amazons, but larger; paler in color below, especially on the breast and sides; back and rump lighter, clearer green, the back markedly so.

Measurements. —

| No. | Sex. | Locality. | Wing. | Tail. | Tarsus. | Exposed Culmen. |
|--------|-------|------------------|-------|-------|---------|-----------------|
| 14,092 | ♂ ad. | City of Panama | 49 | 40 | 12.2 | 6.8 |
| 14,091 | ♂ ad. | do. | 48 | 38 | 12. | 6.8 |
| 14,093 | ♀ ad. | do. | 48 | 39 | 12.2 | 7. |
| 8,035 | ♀ ad. | Chiriqui, Divala | 47 | 39 | 12. | 7. |

Remarks. — This little tyrant is quite different from *Tyrannulus elatus* (Lath.), and in a former paper was referred by Bangs to true *T. reguloides* Ridg., on the strength of one female collected by Brown at Divala, Chiriqui. The three additional examples taken at Panama on the present trip, caused us to doubt its identity with the form of the Lower Amazons and we sent all four examples to Mr. Harry C. Oberholser who kindly compared them with the type. He found the Panama bird represents a fairly well constituted northern subspecies, differing from true *T. reguloides* in its larger sizes, paler yellowish green breast, paler yellow sides, and lighter clearer green back and rump.

39. *Elainea pagana subpagana* SCL. & SALV.

Eight adults, both sexes, May 2 to 11.

40. *Elainea albivertex* PELZ.

Seven adults, both sexes, May 2 to 21. These are very similar to the series from Santa Marta on which *E. sororia* Bangs was based, but are slightly smaller and thus approach *E. sordidata* of the Pearl Islands. The bill, however, is not so large as in the island form.

41. *Sublegatus arenarum* SALVIN.

One adult ♂, May 17.

42. *Myiozetetes cayennensis* (LINN.).

Two adults, ♂ and ♀, May 2 and 7.

43. Myiozetetes similis superciliosus (Br.).

Six specimens, young and adult, May 4 to 21.

44. Myiodynastes audax nobilis (SCL.).

Three adults, both sexes, May 2 to 26.

45. Onychorhynchus mexicanus mexicanus (SCL.).

Four specimens, both sexes, May 11 to 26.

46. Myiobius atricauda (LAWR.).

Two specimens, ♂ and ♀, May 6 and 8.

47. Myiobius naevius naevius (BODD.).

Two adult males, May 3 and 17.

48. Empidonax traillii alnorum BREWST.

Two females, May 2 and May 6. All other North American migrants had left for the north by May; and Mr. Brown saw resident species only, except this Empidonax. The alder flycatcher does not arrive on its breeding grounds in eastern North America till the first week in June, and leaves for the south again so early that on a former trip Mr. Brown took one at Pedregal, Panama, Aug. 21. It thus appears to spend a shorter time in the north than any other migratory small bird. The two specimens have been identified by Mr. William Brewster.

49. Myiarchus ferox panamensis (LAWR.).

Two adult males, May 6 and 19.

50. Muscivora tyrannus (LINNÉ).

Five adults, both sexes, May 4 to 26.

TURDIDAE.**51. Merula grayii casius (Br.).**

Six adults, both sexes, May 4 to 11.

TROGLODYTIDAE.**52. Phengopedius fasciato-ventris albigularis (SCL.).**

Four adults, both sexes, May 4 to 10.

53. Phengopedius hyperythrus (SALV. & GODM.).

Five adults, both sexes, May 4 to 14.

54. *Troglodytes musculus inquietus* (BAIRD).

Five adults, both sexes, May 3 to 19.

55. *Thryophilus rufalbus castanonotus* RIDG.

Twelve adults, both sexes, May 5 to 21.

56. *Thryophilus galbraithii galbraithii* (LAWR.).

Nine adults, both sexes, May 5 to 22.

57. *Thryophilus modestus elutus* BANGS.

Three males, two adult, one young, May 5 to 11.

VIREONIDAE.**58. *Vireosylva flavoviridis flavoviridis* CASSIN.**

Seven adults, both sexes, May 2 to 8.

59. *Pachysylva aurantiifrons aurantiifrons* (LAWR.).

Four adults, both sexes, May 4 to 11.

60. *Pachysylva viridiflava* (LAWR.).

Nine adults, both sexes, May 2 to 26. All these have pale bills, while the two skins collected by Mr. Brown in Chiriqui have the bill black; otherwise the Panama and Chiriqui birds seem to be identical. (See Ridgway, Birds N. and Mid. Amer., Vol. 3, p. 221, foot-note b.)

HIRUNDINIDAE.**61. *Progne chalybea chalybea* (GMEL.).**

One young male, May 20.

MOTACILLIDAE.**62. *Anthus parvus* LAWR.**

Eighteen specimens, adults of both sexes and young, May 9 to 24

MNIOTILTIDAE.**63. *Chrysocantor erithachorides* (BAIRD).**

Five adult males, May 17 to 21. All taken in the mangrove swamps, where they were not at all common, and very hard to obtain.

64. *Basileuterus rufifrons mesochrysus* (SCL.).

Five adults, both sexes, May 3 to 11.

65. *Rhodinocichla rosea eximia* RIDG.

Nine adults, both sexes, May 4 to 25.

COEREBIDAE.**66. *Cyanerpes cyaneus* (LINNÉ).**

Nine adult males, May 12 to 26.

67. *Dacnis cayana ultramarina* (LAWR.).

Five adults of both sexes, May 8 to 25.

ICTERIDAE.**68. *Zarhynchus wagleri wagleri* (GRAY).**

Two adult females, May 15.

69. *Cacicus vitellinus* LAWR.

Twenty-four specimens, adults of both sexes, May 13 to 26, and two young in nestling plumage, — ♂, May 26, ♀, May 23.

The young (nestlings) differ from the adults in having the yellow portions much paler and without the orange tint, the black duller and browner, and in having very small, weak bills.

70. *Amblycercus holosericeus* (LICHT.).

Twelve adults, both sexes, May 2 to 20.

71. *Megaquiscalus major macrourus* (SWAINSON).

One adult female, May 25. The grackle is one of the birds relentlessly hunted for food by the natives, and is found, consequently, in very small numbers, and is exceedingly shy.

72. *Leistes militaris* (LINNÉ).

Twenty-two specimens, adults of both sexes, May 20 to 26; and one young female in nestling plumage, May 26. This differs from the adult ♀ only in having the feathers of the back and wings, except the primaries, edged all round with yellowish brown.

TANAGRIDAE.**73. *Tanagra cana* SWAINSON.**

Two adult males, May 4 and 22.

74. *Ramphocelus dimidiatus isthmicus* RIDG.

Twenty-seven adults, both sexes, May 2 to 23. This is a strongly characterized subspecies; its long tail and pale colors, and the brownish patch on the belly in the male at once separating it from true *R. dimidiatus* of Colombia. It is a remarkable fact in distribution, however, that the Chiriqui bird is true *dimidiatus*, and the Panama form occupies, so far as known, only a small area along the Panama Railroad.

75. *Tachyphonus rufus* (BODD.).

One adult ♀, May 26.

76. *Eucometis cristata* (DU BUS.).

Two adults, ♂ and ♀, May 21 and 26.

77. *Phoenicothera fuscicauda erythrolaema* (SCL.).

Ten adults of both sexes, May 4 to 26.

In his "Birds of North and Middle America," Part 2, p. 153, Ridgway states that though some Panama birds were paler than northern examples, the subspecies is not worthy of recognition. The present series of ten examples, however, seems to prove that there is a very pallid race, perhaps confined to the arid region immediately about the city of Panama, as a series from Loma del Leon formerly referred to this subspecies by Bangs belongs rather with true *P. fuscicauda*.

The type in Selater's collection (now in the British Museum) was supposed to have come from Santa Marta, Colombia. We, however, entertain some doubt as to this supposed origin, because none of the collectors who have visited the Santa Marta region of late years have secured the bird there, and ant tanagers are birds that most collectors secure. Be this as it may, however, the type belongs to the pale form now under consideration.

Recently, when Mr. Gerritt S. Miller, Jr., was in the British Museum, we sent him specimens of both forms, which he carefully compared with the Selater type, and wrote us that it agreed with the pale birds from the Savanna of Panama.

P. fuscicauda erythrolaema differs from true *P. fuscicauda* in its paler colors throughout. The male has the throat patch much paler (pale scarlet), the rest of the plumage paler and duller, the occiput and sides of head decidedly grayer; the female paler, more olive, less brown.

FRINGILLIDAE.**78. *Arremonops conirostris conirostris* (BR.).**

Ten adults, both sexes, May 2 to May 23.

79. *Volatinia jacarini splendens* (VIEILL.).

One adult ♂, May.

80. *Tiaris olivacea dissita*, subsp. nov.

Nine adults, both sexes, May 2 to 14.

Type. — Coll. E. A. and O. Bangs, No. 14,212, adult ♂, Savanna of Panama, May 12, 1904.

Characters. — Similar in color to *T. olivacea intermedia* Ridgw. from Cozumel Island, but much smaller. Differing from *T. olivacea pusilla* (Swains.) from Mexico, in that the adult male never has the crown and auricular region black. Adult ♀ rather greener, less grayish than the adult ♀ of *T. olivacea pusilla*.

Color. — Adult ♂, supraloral spot, eye-brow, chin, upper throat, and spot on lower eye-lid bright yellow; lower throat, breast, lores, malar region, and anterior portion of forehead, and a narrow line along sides of crown, black; top of head and rest of plumage dull grayish olive, paler, more whitish on middle of belly. Adult ♀, plain grayish olive, the black and yellow markings of the male usually slightly indicated, paler, more whitish, on the middle of the belly.

Measurements. —

| No. | Locality. | Sex | Wing. | Tail. | Tarsus. | Culmen. |
|--------|------------------------|-------|-------|-------|---------|---------|
| 14,212 | Savanna of Panama | ♂ ad. | 49.5 | 37.5 | 16.2 | 8.8 |
| 14,213 | do. | ♂ ad. | 49. | 38. | 16.4 | 9.2 |
| 14,214 | do. | ♂ ad. | 49.5 | 34. | 16.4 | 9.2 |
| 14,215 | do. | ♂ ad. | 48.5 | 39.5 | 15.8 | 9.2 |
| 40,786 | M. C. Z. do. | ♂ ad. | 50. | 40. | 16.8 | 9.4 |
| 40,785 | M. C. Z. do. | ♂ ad. | 49.5 | 39. | 16.8 | 9.4 |
| 40,787 | M. C. Z. do. | ♂ ad. | 49. | 39. | 17. | 9.4 |
| 40,788 | M. C. Z. do. | ♀ ad. | 48. | 38. | 16. | 9.2 |
| 14,216 | do. | ♀ ad. | 48. | 35. | 15.8 | 9.2 |
| 7,590 | Loma del Leon, Panama. | ♂ ad. | 48. | 40. | 16.4 | 9.4 |
| 9,313 | Boquete, Chiriqui. | ♂ ad. | 50. | 40. | 16.8 | 9. |
| 9,314 | do. | ♂ ad. | 49. | 38. | 16.2 | 9.2 |
| 9,315 | do. | ♂ ad. | 49. | 40. | 16.4 | 9.4 |

Remarks. — There appears to be a wide gap in Central America between the ranges of the present form and *T. olivacea pusilla*, where no grassquit occurs. The new form extends from the Bogota region north to Costa Rica; *T. olivacea pusilla* from eastern Mexico south to Guatemala, leaving most of Guatemala and Nicaragua, Honduras and Salvador, between the ranges of the two, apparently unoccupied by a member of the genus.

T. olivacea dissita can at once be separated from true *T. olivacea olivacea* of the Greater Antilles by the black of the under parts extending over the breast, otherwise it is much like it; from *T. olivacea intermedia* of Cozumel Island,

which it greatly resembles in color, by its smaller size; and from *T. olivacea pusilla* of Mexico by the adult male having the crown and auriculars olive, not black.

81. *Sporophila minuta minuta* (LINNÉ).

Eight specimens, adults of both sexes, and one young male, May 2 to 19.

82. *Sporophila gutturalis* (LICHT.).

One adult ♂, May 2.

83. *Sporophila aurita* (BR.).

Nine adults, both sexes, May 2 to 24.

84. *Oryzoborus funereus* SCL.

Nine specimens, adults of both sexes, and two young males, May 3 to 22.

85. *Saltator magnoides intermedius* (LAWR.).

Eight adults, both sexes, May 4 to 23.

86. *Saltator albicollis isthmicus* (SCL.).

Nine adults, both sexes, May 6 to 22.

IV. REPTILIA AND AMPHIBIA. BY THOMAS BARBOUR.

A considerable number of reptiles and amphibians were taken by Mr. Brown on San Miguel and Saboga Islands. He collected also in the vicinity of the city of Panama, and the specimens obtained in all of these localities are included in this paper. The fauna of the islands is not fundamentally different from that of the mainland, whence all the species on the islands appear to have been derived. A few differentiated forms are, however, recognizable.

GECKONIDÆ.

1. *Gonatodes caudiscutatus* (GÜNTHER).

Distribution. — Panama, Colombia, and Ecuador.

Of this common species there are sixty-five examples from San Miguel Island and eleven from Saboga Island.

2. *Gonatodes fuscus* (HALLOWELL).

Distribution. — Colombia and Central America.

This species is represented by twenty-three examples from San Miguel Island and fifteen from Saboga Island.

3. Sphaerodactylus lineolatus LICHTENSTEIN.

Distribution. — Central America.

Thirteen specimens from San Miguel Island.

4. Thecadactylus rapicaudus (HOULTUYN).

Distribution. — Central and South America and the Antilles.

Eighteen specimens from Saboga Island and six from San Miguel Island.

IGUANIDAE.

5. Anolis sallaei GÜNTHER.

Distribution. — Central America.

San Miguel four specimens, and thirty-nine from Saboga Island.

6. Basiliscus americanus LAURENTI.

Distribution. — Central America.

Eleven from Panama, thirteen from San Miguel Island, and four of unknown locality. Adults and young, males and females.

7. Iguana tuberculata LAURENTI.

Distribution. — Lesser Antilles, Central and South America.

A single specimen from Saboga Island.

8. Ctenosaura completa BOCOURT.

Distribution. — Mexico and Central America.

With some hesitation I place under this species six specimens from San Miguel Island and one from Panama.

TEIIDAE.

9. Ameiva surinamensis (LAURENTI).

Distribution. — Central and South America.

This lizard was apparently very common, for six were taken on San Miguel Island and twenty near Panama. As four specimens lost their locality labels in transportation the species may be represented on Saboga Island also.

SCINCIDAE.

10. Mabuia agilis (RADDI).

Distribution. — Mexico, Central and South America.

To this species Dr. Stejneger referred four specimens from Panama, and for his kindness in examining these and other specimens I thank him heartily.

TYPHLOPIDAE.

11. *Typhlops emunctus* GARMAN.

Distribution. — Panama.

A single specimen from San Miguel Island, 135 mm. in length, appears to belong to this species. It is in rather poor preservation, and the details of the head scales are very vague.

BOIDAE.

12. *Epicrates sabogae*, sp. nov.

Types. — No. 6986, Mus. Comp. Zool.

Two specimens, one entire, and one skin from Saboga Island.

This island species approaches *E. cupreus* Fischer in color. It is rather dark reddish brown. Its squamation, however, distinguishes it at once from the mainland form. The scales are extremely small. Boulenger (Cat. Snakes, Brit. Mus., vol. 2, p. 95) says that the scales in *E. cenchris* are in 45-51 rows; he also includes *E. cupreus* in this species. The Saboga specimens have scales in 65 and 67 rows, an excess of 14 and 16 over the maximum number for *E. cenchris*. The number of ventrals and subcaudals, 242 and 247, and 49 and 70, do not show any great variation from the continental form, though 70 is 4 in excess of the largest ventral scale count cited by Boulenger. Both specimens are the same size and measure four feet in length. The perfect specimen appears to be an adult male.

COLUBRIDAE.

13. *Spilotes salvinii* GÜNTHER.

Distribution. — Mexico and Central America.

Two large specimens were taken on San Miguel Island.

14. *Herpetodryas fuscus* (LINNÉ).

Distribution. — Tropical South America.

With this very variable species I identify two snakes from San Miguel Island and eight from Saboga Island.

15. *Drymobius margaritiferus* (SCHLEGEL).

Distribution. — Mexico to Colombia and Venezuela.

Three examples from Panama.

16. *Leptophis occidentalis* (GÜNTHER).

Distribution. — Central and Northwestern South America.

Six specimens from San Miguel Island.

17. Himantodes cenchoa (LINNÉ).

Distribution. — Mexico, Central and tropical South America.

A single typical example from San Miguel Island.

18. Leptodira personata COPE.

Distribution. — Lower Mexico and Central America.

A single specimen from San Miguel Island has its scales in twenty-three rows.

19. Oxyrhopus cloelia (DAUDIN).

Distribution. — Continental tropical America and the Lesser Antilles.

Two specimens from Panama.

20. Oxybelis acuminatus (WIED).

Distribution. — Continent of tropical America.

This species is represented by two specimens from Panama, nine from San Miguel Island, and ten from Saboga Island. The locality tags were lost from several other specimens.

21. Homalocranium fuscum (BOCOURT).

Distribution. — Central America.

A single specimen from Panama.

22. Hydrus platurus (LINNÉ).

Distribution. — Indian and tropical Pacific Oceans.

It is interesting to find in this series, from a limited region, varieties C, D, and E which Boulenger describes on page 268 of the catalogue of snakes in the British Museum, vol. 3.

Mr. Brown took fourteen specimens at San Miguel Island and twelve at Saboga Island.

23. Elaps fitzingeri JAN.

E. fulvus D. Boulenger Cat. Snakes, Brit. Mus., 1896, vol. 3, p. 425.

Distribution. — Mexico and Central America.

Three specimens from San Miguel Island.

24. Elaps fulvius (LINNÉ).

Distribution. — Southeastern North America, Mexico, and Central America.

A single specimen from Panama.

COECILIIDAE.

25. Coecilia ochrocephala COPE.

Distribution. — Panama.

A single specimen from the type locality.

26. *Coecilia gracilis* SHAW.

Distribution. — Northern South America.

A single specimen apparently of this form is before me, from Panama. This locality is rather distant from the hitherto known range of the species. There are 199 circular rings, all of which are interrupted dorsally except the hindermost. The great majority of the rings are characteristically interrupted ventrally also. A few, however, are complete below.

27. *Coecilia sabogae*, sp. nov.

Types. — Two specimens, No. 2425 Mus. Comp. Zoöl., from Saboga Island.

Head narrowing anteriorly, snout decurved, projecting acutely beyond mouth; eyes visible or almost invisible; tentacle on the under surface of snout, directly below the nostril. 175–180 circular folds, equidistant, complete above and below. Slate gray, plicae darker, head much lighter. Total length 272 and 381 mm., diameter 7 and 8 mm. (The specimens have evidently shrunk.)

ENGYSTOMATIDAE.

28. *Phryniscus laevis* GÜNTHER.

Distribution. — Western South America.

A single male from Panama.

CYSTIGNATHIDAE.

29. *Leptodactylus insularum*, sp. nov.

Types. — Twelve specimens, No. 2424, Mus. Comp. Zoöl., from Saboga Island.

Dr. Stejneger, who has very kindly examined specimens of this species, writes me as follows: "They seem to belong to the *L. caliginosus* group, some of which seem to have dorso-lateral folds. I cannot make up my mind to identify them with any of the described species. The angularity of the teeth seems to be extreme, and recalls *L. fragilis* Bocourt and *L. raniformis* Werner, the latter from Colombia, but these are supposed to be without dermal edges to the toes." Dr. Stejneger also adds that these specimens are much larger than certain so-called *L. melanonotus* which are in the United States National Museum, and which are probably adult because the males have well-developed manual spines.

Tongue oval, slightly nicked behind. Vomerine teeth in two slightly curved series behind the choanae. Nostril nearer the tip of the snout than the eye. Tympanum half the width of the eye. Toes very conspicuously fringed. Subarticular tubercles well developed; two small metatarsal tubercles. Skin smooth, with few warts above. A ventral discoidal fold and well-marked dorso-lateral folds. Deep slaty above with indistinct darker marking.

A dark heart-shaped spot on the occiput. In females hinder side of thighs with marbling of brown; males with thighs the color of the dorsum. Male with an internal vocal sac, and two spine-bearing tubercles in the inner side of the first digit. These manual spines are deep black. The males, which seem to have been taken in the breeding season, have the fore limbs very much swollen.

Mr. Brown also took several specimens on San Miguel Island.

30. *Hylodes brocchi* (BROCCHI).

Distribution. — Guatemala.

One specimen from San Miguel Island.

BUFONIDAE.

31. *Bufo marinus* (LINNÉ).

Distribution. — South and Central America, West Indies.

Two specimens from San Miguel Island.

32. *Bufo spinulosus* WIEGMANN.

Distribution. — Northwestern South America.

Two examples from Panama.

HYLIDAE.

33. *Hyla leucophyllata* BEIRIS.

Distribution. — Tropical South America.

Five examples from Panama.

V. PISCES. BY SAMUEL GARMAN.

Among the species secured by this expedition there are some of particular importance on account of being previously unrepresented in the collection of the Museum; all of them appear to have been described heretofore. The embryonic material is of especial interest and value.

The list includes the following:—

| | |
|---------------------------------------|---------|
| <i>Carcharinus cerdale</i> Gilb. | Panama. |
| <i>Carcharinus aethalorus</i> J. & G. | " |
| <i>Carcharinus azureus</i> Gilb. | " |
| <i>Sphyrna zygaena</i> Linné. | " |
| <i>Ginglymostoma cirratum</i> Gmel. | " |
| <i>Urolophus aspidurus</i> J. & G. | " |
| <i>Dasybatus longa</i> Garm. | " |
| <i>Myliobatis asperimus</i> Gilb. | " |

| | |
|--|-------------|
| <i>Aetobatis narinari</i> Euph. | Panama. |
| <i>Batrachus pacifici</i> Günt. | " |
| <i>Eleotris pictus</i> Kner. | Gorgona. |
| <i>Eleotris dormitatrix</i> Bl. & S. | " |
| <i>Eleotris maculata</i> Bloch. | Panama. |
| <i>Gobius soporator</i> C. & V. | San Miguel. |
| <i>Achirus fonsecensis</i> Günt. | Panama. |
| <i>Achirus scutum</i> Günt. | " |
| <i>Trachinotus fasciatus</i> Gill. | Gorgona. |
| <i>Lutianus aratus</i> Günt. | " |
| <i>Lutianus argentiventris</i> Pet. | San Miguel. |
| <i>Pristipoma humile</i> K. & S. | Gorgona. |
| <i>Eucinostomus californiensis</i> Gill. | San Miguel. |
| <i>Agonostoma nasutum</i> Günt. | Gorgona. |
| <i>Mugil curema</i> C. & V. | San Miguel. |
| <i>Poecilia elongata</i> Günt. | " " |
| <i>Poecilia boucardii</i> Steind. | Panama. |
| <i>Galeichthys eigenmanni</i> G. & S. | " |
| <i>Tetragonopterus panamensis</i> Günt. | San Miguel. |